Ann. Natal Mus. Vol. 36 Pages 141–145 Pietermaritzburg October, 1995

# First record of *Conarete* (Diptera: Cecidomyiidae: Lestremiinae) in the Afrotropical Region, and notes on the loss of ocelli in the tribe Lestremiini

by

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## ABSTRACT

*Conarete calcuttaensis* Nayar, 1949, is recorded from South Africa, the first record of the genus outside of India and North America. Illustrations are provided to facilitate species recognition. A short review is given of *Conarete*, and the genus is differentiated from *Anarete*. The two genera share several characteristics, including the swarming habit, a reduction of the number of antennal flagellomeres, and the large tarsal claws with many teeth, at least in males. Ocelli are lost in males of *C. calcuttaensis*, as they are in some other species of *Conarete* and *Anarete*.

## DISCUSSION

Dr Brian Stuckenberg of the Natal Museum recently sent me a series of male gall midges he caught swarming in his garden in Merrivale, Natal, South Africa. The flies lacked ocelli, which prevented him from keying them satisfactorily to genus with the available literature. In existing keys to genera, including my own (Gagné 1981), no provision is made for separating Lestremiinae without ocelli. Recognizing the specimens as belonging to the genus *Conarete*, I searched for available references to the lack of ocelli in the tribe Lestremiini. In only one paper (Pritchard 1951), was a reference to the lack of ocelli in a particular genus at all prominent outside of a species description. I take this occasion to highlight the lack of ocelli in the tribe Lestremiini, correct the lapse in my key, authenticate for the first time the presence of *Conarete* in Africa, give an overview of the genus, and report that male swarming occurs in *Conarete* species.

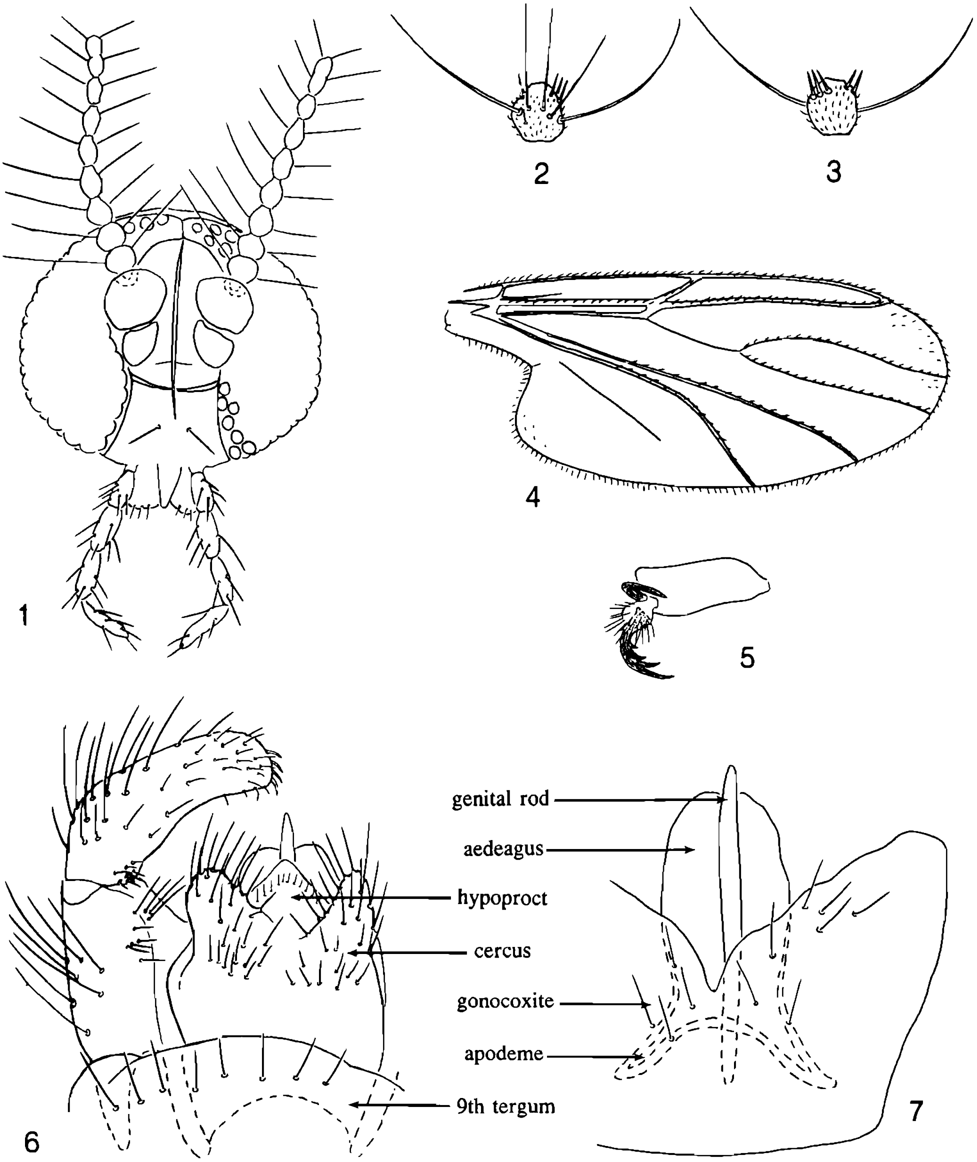
*Conarete* was erected by Pritchard (1951) for four North American and two Indian species. Males of *Conarete* are similar to those of *Anarete* in having only seven to ten flagellomeres, reduced from the 14 found in all other species (males) of Lestremiini. *Conarete* was distinguished from *Anarete* by the presence of a distinct neck and a crenulate row of long bristles on most male flagellomeres, and by the genitalic apodemes being divergent anteriorly instead of parallel as found in *Anarete*. It appears now that the length of the flagellomere necks, whether their bristles are crenulate (large and scalloped at their bases), and the direction of the genitalic apodemes, are not always clearly diagnostic in the non-American species. A better, consistent character to separate the two genera, which Pritchard (1951) noticed but did not make use of in a key, is readily seen in the wing. The tines of the M fork are more or less parallel and $M_1$ slightly sinuous in *Conarete* (Fig. 4), but divergent from the base of the fork and straight in *Anarete*. Another consistent distinguishing character of the two genera is the presence of short, dense, erect bristles on the fore tarsi of female *Conarete*, which are lacking in *Anarete*. This was noted by Pritchard (1951), but does not help to key males unless they are associated with females.

Since Pritchard (1951) initially included six species in *Conarete*, four additional species, from India, have been described. Some of the six species from India may well be synonyms (Grover 1970). All types of the Indian species should be examined together in the future to investigate possible synonymy, especially before additional species are described. The genus should be much more widespread than its known distribution, yet it is remarkable that it has not been reported from Europe, where the subfamily Lestremiinae is best known. Known *Conarete* species, with original citation, combination, sex of type(s), and known geographical distribution, are as follows:

**calcuttaensis** Nayar, 1949: 79 (as *calcuttaense*; *Anarete*); ♂, ♀ ; India, South Africa (new record).
**crebra** Pritchard, 1951: 256 (*Conarete*); ♂, ♀ ; USA.
**deepica** Deshpande, 1983: 124 (*Conarete*); ♂; India.
**eluta** Pritchard, 1951: 257 (*Conarete*); ♂, ♀ ; USA, Dominica (new record).
**eschata** Pritchard, 1951: 257 (*Conarete*); ♂, ♀ ; USA.
**indica** Mani, 1934: 382 (*Microcerata*); ♂; India.
**indorensis** Grover, 1970: 141 (*Conarete*); ♂; India.
**mihijamensis** Grover, 1964: 114 (*Conarete*); ♂, ♀ ; India.
**orientalis** Rao, 1956: 67 (*Conarete*); ♂; India. [Grover 1970 treated this species as a synonym of *calcuttaensis* based on descriptions only.]
**texana** Felt, 1913: 147 (*Microcerata*); ♂; USA.

The South African specimens fit the description of the Indian species *Conarete calcuttaensis* Nayar, insofar as I can determine from the poor original description and without seeing the types. The types are in the Zoological Survey of India (M. Datta, *in litt.*) but that museum does not now lend holotypes. *Conarete calcuttaensis* lacks ocelli, according to Mani (in Pritchard 1951). Figures of this species in Nayar (1949) show a tarsal claw with three subapical teeth and male genitalia with little detail and showing nothing to preclude determination of the South African specimens as *C. calcuttaensis*. The antenna of that species was described as having 11 segments, with each of the nine flagellomeres counted as a segment. Nayar (1949) described the flagellomeres as having short necks, which agrees with the African specimens. I have provided figures of a male head, the third male flagellomere, a male tarsal claw, a wing, and the male genitalia (Figs 1–7) of the South African specimens, which should help identify this species in future.

Pritchard (1951) wrote that *C. calcuttaensis* was probably a synonym of *Conarete indica* Mani, 1934, but did not give any reason. The original descriptions of the antennae of the two species do not quite agree. Mani (1934) wrote that the antenna of *C. indica* was eight-segmented (each flagellomere counted as a segment). Mani must have overlooked the scape because his figure of the flagellum shows seven flagellomeres. The antenna of *C. calcuttaensis* has 11 segments, or nine



Figs 1–7. *Conarete calcuttaensis* Nayar, 1949. 1. Head, male, frontal view. 2. Third male flagellomere, ventral. 3. Same, dorsal. 4. Wing. 5. Fifth tarsomere with claws and empodium, ventrolateral. 6. Male genitalia, left half, dorsal. 7. Male gonopod and aedeagus, right half, ventral.

flagellomeres, with very short necks, unlike those of *C. indica*. The antennae of the South African specimens have eight or nine flagellomeres, depending on whether the distal-most article is partially or fully subdivided, and have shorter necks than Mani (1934) showed for *C. indica*. Mani further described his species as having a three-segmented palpus; the palpus of *C. calcuttaensis* and the South African specimens are four-segmented.

That a *Conarete* species should be distributed in both India and South Africa does not seem remarkable because many Lestremiinae are widespread. One of the American species, *C. eluta*, previously known only from Minnesota, USA, is newly recorded here from Dominica in the West Indies. Some *Anarete* species have a wide geographic distribution: *Anarete corni* (Felt), *Anarete johnsoni* (Felt), and *Anarete lacteipennis* Kieffer are Holarctic (Skuhravá 1986), and *Anarete buscki* (Felt) is widespread in North America and also occurs in Puerto Rico (Kim 1967).

Males of both *Conarete* and *Anarete* have large, multidentate tarsal claws, presumably an adaptation for grasping females in flight. *Anarete* species are well-known swarmers (Chiang 1968), and, with the discovery of a swarm of *C. calcuttaensis* in South Africa, the habit is now known to occur in *Conarete* also. The short antennae of both genera may be adaptations for fast flight.

To preclude further difficulty on the lack of ocelli when using the key to genera of Nearctic Cecidomyiidae (Gagné 1981), the first sentence of the second half of couplet 5 can be emended to read: 'Head with two ocelli or none (in some *Conarete*).' The key in Pritchard (1951) separated Lestremiini from other tribes on the basis of two or no ocelli, but his key did not note which genus or genera lacked them. Under the generic heading for *Conarete*, one reads that the genus has two or no ocelli and, according to Mani (in Pritchard 1951), the Indian species (then only *C. indica* and *C. calcuttaensis*) lack ocelli. Pritchard's key to males of the four American *Conarete* species indicates that two species have ocelli and two do not. Mamaev (1975) noted that in only a few tropical species of Lestremiini are ocelli absent, but he made no further mention of this lack of ocelli in his book. Males of five of the six Indian species reportedly lack ocelli, but their presence or absence was left unnoted in the sixth species, *C. deepica*. Interestingly, females of at least *C. indorensis* and *C. mihijamensis* have ocelli (Grover 1964 1970), but both sexes of two American species lack them.

Males of the Indian *Anarete allahabadensis* and *Anarete sitapurensis* also lack ocelli, although their females have them (Grover 1964 1970). The loss of ocelli in *Conarete* and *Anarete* evidently occurred separately in each genus. Ocelli are present in some males and females of both genera and are, as far as is known, present in all other Lestremiini.

## ACKNOWLEDGEMENTS

I am grateful to B. R. Stuckenberg of the Natal Museum for bringing this interesting find to my attention, Dr. M. Datta of the Zoological Survey of India in Calcutta for checking on the deposition of types in the collection under his care, and A. L. Norrbom and J. Pakaluk of the Systematic Entomology Laboratory, Washington, D. C., and Edvard Sylvén of the Swedish Museum of Natural History, Stockholm, for their helpful reviews of drafts of the manuscript.

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Date received: 19 July 1994